

CLAIMS

WHAT IS CLAIMED:

1. A method, comprising:

5 selectively applying one or more etchants to an edge region of a substrate, said substrate having a central region adjacent to said edge region, wherein a metallization layer stack is formed at least on said central region, said metallization layer stack comprising at least an insulating layer, a barrier layer and a metal layer; and

10 removing unwanted material at least of said metal layer and said barrier layer selectively from said edge region.

15 2. The method of claim 1, further comprising removing material of said insulating layer selectively from said edge region.

3. The method of claim 1, wherein said one or more etchants comprise a diluted compound of nitric acid and hydrofluoric acid.

20 4. The method of claim 1, wherein a first etchant is applied to remove material of said metal layer, and a second etchant is applied to remove material at least of said barrier layer.

25 5. The method of claim 4, wherein at least said second etchant comprises said diluted compound of nitric acid and hydrofluoric acid.

6. The method of claim 4, wherein said first etchant is substantially devoid of nitric acid.

7. The method of claim 6, wherein said metal layer comprises copper.

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8. The method of claim 1, wherein said substrate is exposed in said edge region during said material removal.

9. The method of claim 1, wherein applying said etchant is performed in an 10 substantially air-tight ambient to substantially avoid the emission of gaseous nitric oxides.

10. The method of claim 1, further comprising applying said etchant at the back side of said substrate to remove unwanted material.

15 11. The method of claim 1, wherein said metal layer comprises copper and is formed by an electro-chemical process.

12. A method of reducing contamination of a substrate after formation of a metallization layer stack on said substrate, the method comprising:

20 selectively removing unwanted material from an edge region of said substrate by using a first etchant comprising a diluted compound of nitric acid and hydro-fluoric acid as the main component.

13. The method of claim 12, wherein at least material of a barrier layer of said metallization layer stack is removed.

5 14. The method of claim 13, wherein dielectric material is removed so as to expose said substrate at said edge region.

15. The method of claim 12, wherein unwanted metal of said metallization layer is removed.

10 16. The method of claim 12, further comprising removing unwanted metal with a second etchant other than said first etchant from said edge region prior to selectively removing unwanted material with said first etchant.

15 17. The method of claim 12, wherein said metallization layer comprises copper and selectively removing unwanted material with said first etchant is performed in a protected environment to substantially avoid liberation of gaseous nitric oxide.

20 18. The method of claim 12, further comprising removing unwanted material from a back side of said substrate.

19. A semiconductor structure, comprising:
a substrate having a front side and a back side, said front side divided into a device region and an edge region;
a plurality of semiconductor devices formed in and over said device region, each semiconductor device comprising at least one metallization layer including a

dielectric layer and a metal line, said metal line formed in said dielectric layer and being separated therefrom by a conductive barrier layer;
wherein said edge region is substantially devoid of material of said metal line, said barrier layer and said dielectric layer.

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20. The semiconductor structure of claim 19, wherein said dielectric layer comprises a low-K material having a permittivity of less than approximately 3.0.

10 21. The semiconductor structure of claim 19, wherein said edge region includes a bevel.

22. The semiconductor structure of claim 19, wherein said metal line comprises copper.

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